

In the Specification:

Please amend the paragraph at **page 1, lines 15 to 21**, as follows:

A prior-art linear bearing used for such a guide post is, for example, a ball bearing having ~~[[a]]~~ multiple steel balls received in a cylindrical retainer, or a needle bearing having ~~[[a]]~~ multiple needles received in a tubular retainer of a polygonal shaped cross section, as shown in Japanese patent application laying-open publication No. 3-81035.

Please amend the paragraph at **page 5, line 11 to page 6, line 14**, as follows:

In a third embodiment, the ram includes a round outer circumferential surface. The column is disposed around the ram and has a through hole of a round cross sectional shape. A plurality of pockets are formed on the through hole of the column. Inside each pocket are provided a roller-shaped rolling element that rolls axially on the ram, and a supporting shaft that rotatably supports the rolling ~~element rotatably.~~ element. The rolling element has a concavely curved cylindrical surface. A radius  $r$  of curvature of a generating line of the cylindrical surface satisfies the ~~inequality,~~ inequality:  $0.52D \leq r \leq 0.58D$ , wherein  $D$  is a diameter of the outer circumferential surface of the ram. The rolling element may have a cylindrical surface with a linear generating line. Alternatively, the rolling element may include a first

rolling element that satisfies the above inequality and a second rolling element having a linear generating line. The first rolling element may be placed at a region where relatively greater loads are applied and the second rolling element may be placed at a region where relatively smaller loads are applied. Each of the pockets is formed at an opening of the through hole of the column and the several pockets are spaced equally circumferentially. Each supporting shaft is inserted into a supporting hole formed in each pocket, and is supported on both end portions. Preferably, each supporting hole ~~penetrates~~ penetrates the outer circumferential surface of the column. Between the ram and the column may be interposed a thin-walled, cylindrical member that has a plurality of apertures corresponding to the pockets of the column and that can bear a radial load. The cylindrical member may be formed of bearing materials.

Please amend the paragraph at **page 6, line 15 to page 7, line 15**, as follows:

In operation, when the ram and column ~~slides~~ slide relative to each other, the rolling elements roll axially on the ram flat portions. In this case, since each rolling element acts as a linear bearing, a retainerless guide device is achieved. Also, since the cylindrical surface of the rolling element is concavely curved, a contact area with the ram increases and a surface pressure of the rolling surface decreases, thereby improving wear

resistance and ~~advancing~~ increasing an allowable load. Furthermore, smooth rotation of the rolling elements can be secured and skewing of the rolling elements can be prevented. Additionally, in the case that radius  $r$  of curvature of the generating line of a rolling element is smaller than  $0.52D$ , smooth rotation of the rolling element is hindered and differential slippage tends to occur. In the case that radius  $r$  of curvature of the generating line of a rolling element is larger than  ~~$0.52D$~~ ,  $0.58D$ , contact area decreases and an allowable load tends to be lowered. When a cylindrical surface of the rolling element has a linear generating line, working of the rolling element becomes easier. Also, since each pocket is disposed at an opening of the through hole of the column, the axis of the column is prevented from inclining relative to the axis of the ram when a radial load is applied. Moreover, since each supporting hole penetrates the outer circumferential surface of the column, boring of the column will be conducted more accurately and easily.

Please amend the paragraph at **page 8, lines 21 to 22**, as follows:

Fig. 10 is a perspective view of a thin-walled cylindrical member used with the guide device of ~~FIG. 1.~~  
FIG. 6.

Please amend the paragraph at **page 9, lines 6 to 8**, as follows:

The ram 2 has an outer circumferential surface of a ~~squared~~ generally square cross sectional shape formed of

four flat portions 20. Each of the flat portions 20 extends axially.

Please amend the paragraph at **page 9, lines 9 to 13**, as follows:

The column 3 is disposed around the outer circumferential surface of the ram 2 and has a central through hole 3a of a ~~squared~~ generally square cross sectional shape formed of four flat portions 30 each disposed opposite to each flat portion 20 of the ram 2. A needle bearing 5 is provided at each flat portion 30.

Please amend the paragraph at **page 9, line 21 to page 10, line 2**, as follows:

Each supporting shaft 4 is inserted into a supporting hole ~~[[35]]~~ 34 formed in the column 3 and is supported on both ends in the supporting hole ~~[[35-]]~~ 34. Thereby, supporting rigidity is improved and thus, adequate support of the needle bearing 5 is secured. Also, each supporting shaft 4 extends toward the direction perpendicular to the extending direction of each flat portion 20 of the ram 2.

Please amend the paragraph at **page 10, lines 19 to 22** as follows:

As is clearly seen in FIGS. 2 and 3, the needle bearings 5 provided at adjacent flat portions 30 of the central through hole 3a are disposed at each corner of the central through hole 3a. As can be seen, each corner area or portion of both the ram 2 and the column 3 may be a beveled corner area having a bevel surface between the

adjacent flat portions 20 or 30 where the adjacent flat portions effectively meet.

Please amend the paragraph at **page 12, lines 11 to 14**, as follows:

In addition, any arising assembly error between the ram 2 and the column 3 can be adjusted by selectively utilizing a selected one of different needle ~~bearing~~ bearings 5 with ~~[[an]]~~ outer ~~[[race]]~~ aces 50 of different outer diameters, which ~~facilitating~~ facilitates adjustment of the whole device.

Please amend the paragraph at **page 13, lines 8 to 13**, as follows:

In the aforementioned embodiments, the ram 2 has an outer circumferential surface of a rectangular (including square) cross sectional shape and the column 3 has a central through hole 3a of a rectangular (including square) cross sectional shape, but the present invention is also applicable to a ram and a column of other polygonal cross sectional shapes.

Please amend the paragraph at **page 13, line 23 to page 14, line 6**, as follows:

The ram 102 has an outer circumferential surface 102a of a round cross sectional shape. The column 103 is disposed outside the outer circumferential surface 102a of the ram 102 and has a through hole 103a of a round cross sectional shape. A plurality of pockets 104 are formed on

an inner circumferential surface of the through hole 103a. Each pocket 104 receives a needle bearing 105 for slidably supporting the column 103 relative to the ram 102 in the axial direction.

Please amend the paragraph at **page 16, line 21 to page 17, line 8**, as follows:

Each supporting shaft 106, shown in FIG. 7, is inserted into a supporting hole 130 formed at each pocket 104 inside the column 103 and both end portions of the supporting shaft 106 ~~[[is]]~~ are supported in the supporting hole 130. Thereby, supporting rigidity of the supporting shaft 106 is improved and adequate support of the needle bearing 105 is secured. Also, each supporting hole 130 penetrates the outer circumferential surface of the column 103, which facilitates boring process of the column 103. Furthermore, since each supporting hole 130 is a through hole, a pitch or a distance from a center of the ram 102 to a centerline of each supporting hole 130 can be made accurate using a working method such as a wire cut electrical discharge machining.

Please amend the paragraph at **page 18, line 20 to page 19, line 8**, as follows:

Those skilled in the art to which the invention pertains may make modifications and other embodiments employing the principles of this invention without departing from its spirit or essential characteristics

particularly upon considering the ~~forgoing~~ foregoing teachings. The described embodiments and examples are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. Consequently, while the invention has been described with reference to particular embodiments and examples, modifications of structure, sequence, materials and the like would be apparent to those skilled in the art, yet fall within the scope of the invention.

Please delete the heading at **page 19, line 25.**

**[RESPONSE CONTINUES ON NEXT PAGE]**